A REVIEW OF HELMINTH SPECIES IN REPTILES OF UZBEKISTAN: FAMILIES TESTUDINIDAE, GEKKONIDAE, AGAMIDAE, ANGUIDAE, LACERTIDAE, AND SCINCIDAE

E.F. Ikromov, E.E. Ikromov, I.K. Rustamov,
Namangan State University

Abstract. This study provides a comprehensive overview of the helminth species associated with reptiles belonging to the families Testudinidae, Gekkonidae, Agamidae, Anguidae, Lacertidae, and Scincidae in Uzbekistan. By examining various reptilian hosts, the research identifies and catalogs the diversity of helminths in these families. The findings contribute to the understanding of host-parasite dynamics and have implications for the conservation and health management of reptile populations in Uzbekistan. Additionally, this work underscores the importance of further research into the ecological interactions between reptiles and their parasitic fauna.

Approximately 65 species of reptiles inhabit the territory of Uzbekistan. Despite such rich biodiversity and their active roles within various biocenoses, there is a limited number of scientific studies dedicated to the species composition of helminths in these reptiles. The historical study of reptilian helminths in Uzbekistan can be divided into three phases. The first phase of research, dating back to the 1960s, primarily features contributions by herpetologists such as O.P. Bogdanov (1954), M.A. Sultanov (1954), Andrushko and Markova (1956), Markova and Bogdanova (1956, 1960), A.M. Andrushko and G.S. Markov (1958), G.S. Markov and O.P. Bogdanov (1961), O.P. Bogdanov and G.S. Markov (1960), G.S. Markov, O.P. Bogdanov, and L.A. Persiyanova (1970). The second phase, from the 1980s to the 1990s, includes the work of helminthologists such as N.M. Matchanov, S. Dadaev, T.K. Kabilov, and B.Kh. Siddikov (1989), as well as M.A. Sultanov, T.K. Kabilov, N. Davlatov (1975), R. Mavlyanova (1982), B.Kh. Siddikov (1984), T.K. Kabilov (1986), N.M. Matchanov, S. Dadaev, T.K. Kabilov, B.Kh. Siddikov (1989), A.T. Azimov, T.K. Kabilov (1993), A.T. Azimov, U. Toshev, and A. Jabbarov (1995), and Sh.I. Kamilova (2000) from the Institute of Zoology of the Academy of Sciences of Uzbekistan. The third phase, commencing in the 21st century, is marked by work from researchers such as D.A. Azimov, A.E. Kuchbaev, and others (2001), I.Sh. Kucharova, A.E. Kuchbaev, E.F. Ikromov (2001), and I.Sh. Kucharova (2007). These studies have continued to advance the understanding of helminth diversity and distribution in Uzbekistani reptiles. However, these studies have been fragmentary. Our systematic research on the species composition of reptilian helminths in Uzbekistan began in 2000.

Specimens of reptiles for research were collected from May to October in the regions of Surxondaryo, Qashqadaryo, Jizzakh, Tashkent, Navoiy, Bukhara, Fergana, Namangan, Andijan, and the Republic of Karakalpakstan. The study of these reptiles was conducted using the complete helminthological dissection method (according to Skrjabin, 1928). A total of 38 species of reptiles belonging to six families were examined.

The results of our multi-year research and literature data (1-5) indicate the distribution of the helminths found among the species of the specified reptile families of Uzbekistan in the following order.

Family Testudinidae

Central Asian Tortoise - *Agrionemys* (*Testudo*) *horsfieldii* (Gray, 1844)

Helminths: Nematodes - *Atractis dactyluris*, *A.emilii*, *Tachygonetria longicollis*, *T. lobota*, *T. macrolaimus*, *T. torticollis*, *T. conica*, *T. dentata*, *Mehdiella stylosa*, *Thaparia thapari*, *Raillietnema uzbekistanica*.

Family Gekkonidae

Smooth Gecko - *Alsophylax laevis* Nikolsky, 1905

Helminths: Cestode - *Oochoristica tuberculate*; Nematode - *Spauligodon annaevi*.

Pallas' Gecko - *Alsophylax pipiens (Pallas, 1814)*

Helminths: Nematode - *Physaloptera praeputiale*, larvae.

Eversmann's Gecko - *Crossobamon eversmanni* (Wiegmann, 1834)

Helminths: Nematodes - *Skrjabinodon schikhobalovi*, *Physocephalus sexalatus*, larvae.

Turkestan Gecko - *Cyrtopodion fedtschenkoi* (Strauch, 1887)

Helminths: Cestodes - *Nematotaenia tarentolae*, *Diplopylidium noelleri*, larvae, *Joyeuxiella echinorhynchoides*, larvae, *Mesocestoides lineatus*, larvae; Nematodes - *Parapharyngodon szczerbaki*, *Thelandros markovi*, *Pharyngodon termezensis*, *Pharyngodon* sp. Siddikov, 1984, *Spauligodon lacerate*, *Vigisospirura potekhini* larvae, *Agamospirura magna* larvae.

Gray Gecko - *Cyrtopodion* (*Mediodactylus*) *russowi* (Strauch, 1887)

Helminths: Cestode - *Nematotaenia tarentolae*; Acanthocephalan - *Macracanthorhynchus catulinus* larvae; Nematodes - *Pharyngodon termezensis*, *Spirocerca lupi* larvae.

Sundevall's Gecko - *Teratoscincus scincus* (Schlegel, 1858)

Helminths: Cestode - *Spirometra erinaceieuropaei* larvae; Nematodes - *Pharyngodon schikhobalovi*, *Spauligodon lacerate*, *Skrjabinodon schikhobalovi*, *Abbreviata uzbekistanica*, *Agamospirura magna* larvae.

Common Teratoscincus - *Teratoscincus s. scincus*

Helminths: Nematode - *Pharyngodon termezensis*.

Family Agamidae

Toadhead Agama - *Phrynocephalus guttatus* (Gmelin, 1789)

Helminths: Cestodes - *Diplopylidium polyacantha* larvae, *D. noelleri* larvae.

Sunwatcher Toadhead Agama - *Phrynocephalus helioscopus* (Pallas, 1771)

Helminths: Cestodes - *Oochoristica tuberculate*, *Diplopylidium acanthoptera* larvae, *D. polyacantha* larvae, *D. noelleri* larvae, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides lineatus* larvae; Acanthocephalans - *Centrorhynchus scanensis* larvae, *Moniliformis moniliformis* larvae; Nematodes - *Spauligodon parasskiffi*, *Skrjabinodon pigmentatus*, *Spirocerca lupi* larvae, *Vigisospirura potekhini* larvae, *Physaloptera clausa* larvae, *Abbreviata uzbekistanica*, *A. abbreviata*, *Pseudabbreviata markovi*.

Said-Aliyev's Toadhead Agama - *Phrynocephalus helioscopus saidaliewi* Sattorov, 1981

Helminths: Cestodes - *Diplopylidium acanthoptera* larvae, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides* sp.1 larvae (Ikromov, Hakimov, 2005), Mesocestoides sp.2 larvae (Ikromov, Hakimov, 2005); Acanthocephalan - *Moniliformis moniliformis* larvae; Nematodes - *Spauligodon parasskiffi*, *Skrjabinodon pigmentatus*, *Abbreviata uzbekistanica*.

Molchanov's Toadhead Agama - *Phrynocephalus moltschanovi* Nikolsky, 1913

Helminths: Cestode - *Oochoristica sobolovi*.

Sand Toadhead Agama - *Phrynocephalus interscapularis* Lichtenstein, 1856

Helminths: Cestodes - *Nematotaenia tarentolae*, *Oochoristica tuberculate*, *O. sobolovi*, *Diplopylidium polyacantha* larvae, *Diplopylidium noelleri* larvae, *Joyeuxiella echinorhynchoides* larvae; Trematode - *Alaria alata* larvae; Acanthocephalan - *Moniliformis moniliformis* larvae; Nematodes - *Spauligodon pseudoeremiasi*, *S. parasskiffi*, *S. phrynocephali*, *Spirocerca lupi* larvae, *Pseudabbreviata markovi*.

Secret Toadhead Agama - *Phrynocephalus mystaceus* (Pallas, 1776)

Helminths: Cestodes - *Nematotaenia tarentolae*, *Oochoristica tuberculate*, *Diplopylidium polyacantha* larvae, *D. noelleri* larvae, *Joyeuxiella echinorhynchoides* larvae; Trematodes - *Plagiorchis elegans* larvae, *Alaria alata* larvae; Acanthocephalan - *Macracanthorhynchus catulinus* larvae; Nematodes - *Parapharyngodon szczerbaki*, *Spauligodon eremiasi*, *Spirocerca lupi* larvae, *Abbreviata uzbekistanica*, *A. abbreviata*, *A. schulzi*, *A. skrjabini*, *Pseudabbreviata markovi*.

Radde's Toadhead Agama - *Phrynocephalus raddei* Boettger, 1888

Helminths: Cestode - *Diplopylidium acanthoptera* larvae; Nematodes - *Spauligodon parasskiffi*, *Physaloptera praeputiale* larvae, *Skrjabinodon pigmentatus*.

Reticulate Toadhead Agama - *Phrynocephalus reticulatus* Eichwald, 1831

Helminths: Cestodes - *Diplopylidium noelleri* larvae, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides* sp.1 larvae, *Mesocestoides* sp.2 larvae (Ikromov, Hakimov, 2005); Acanthocephalans - *Prosthorhynchus aluconis*, *Centrorhynchus globocaudatus acantella*, *Moniliformis moniliformis* larvae; Nematodes - *Spauligodon eremiasi*, *S. parasskiffi*, *Spirocerca lupi* larvae, *Vigisospirura potekhini* larvae, *Abbreviata uzbekistanica*, *A. abbreviata*.

Khentau Toadhead Agama - *Phrynocephalus rossikowi* Nikolsky, 1899

Helminths: Cestodes - *Diplopylidium acanthoptera* larvae, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides lineatus* larvae; Acanthocephalan - *Moniliformis moniliformis* larvae.

Sogdian Toadhead Agama - *Phrynocephalus sogdianus* Cernov, 1948

Helminths: Cestode - *Oochoristica lagrangei*; Nematodes - *Vigisospirura potekhini larvae*, *Abbreviata kazachstanica*.

Strauch's Toadhead Agama - *Phrynocephalus strauchi* Nikolsky, 1899

Helminths: Cestodes - *Nematotaenia tarentolae*, *Oochoristica tuberculate*, *O. lagrangei*, *Diplopylidium acanthoptera* larvae, *D. polyacantha* larvae, *D. noelleri* larvae, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides lineatus* larvae, *Mesocestoides* sp. larvae, *Mesocestoides* sp.1 larvae; Trematodes - *Plagiorchis elegans* larvae; Nematodes - *Parapharyngodon brevicaudatus*, *P. szczerbaki*, *Spauligodon annaevi*, *S. parasskiffi*, *S. saxicolae*, *S. phrynocephali*, *Spirocerca lupi* larvae, *Gongylonema pulchrum* larvae, *Physaloptera clausa* larvae, *Abbreviata uzbekistanica*, *A. dentata*, *Thubunaea* sp.

Turkestan Stellion - *Laudakia lehmanni* (Nikolsky, 1896)

Helminths: Cestodes - *Oochoristica sobolovi*, *Mesocestoides lineatus* larvae; Acanthocephalan - *Moniliformis moniliformis* larvae; Nematodes - *Parapharyngodon szczerbaki*, *Physocephalus sexalatus* larvae, *Physaloptera dentata* larvae, *Abbreviata kazachstanica*.

Chernov's Agama - *Laudakia chernovi* (Ananjeva, Peters et Rzepakovsky, 1981)

Helminths: Cestodes - *Oochoristica lagrangei*, *Diplopylidium noelleri* larvae.

Himalayan Agama - *Laudakia himalayana* (Steindachner, 1869)

Helminths: Cestode - *Nematotaenia tarentolae*; Nematodes - *Parapharyngodon dogieli*, *Thelandros markovi*, *Abbreviata abbreviata*, *Pseudabbreviata* sp. (according to Radchenko, 1976).

Steppe Agama - *Trapelus sanguinolentus* (Pallas, 1814)

Helminths: Cestodes - *Oochoristica tuberculate*, *O. sobolovi*, *O. lagrangei*, *Diplopylidium noelleri* larvae, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides lineatus* larvae; Acanthocephalans - *Moniliformis moniliformis* larvae, *Macracanthorhynchus catulinus* larvae; Nematodes - *Hexadontophorus ophisauri*, *Parapharyngodon dogieli*, *P. brevicaudatus*, *P. skrjabini*, *P. szczerbaki*, *Thelandros markovi*, *T. popovi*, *Pharyngodon* sp. Siddikov, 1984, *Skrjabinodon schikhobalovi*, *Spirocerca lupi* larvae, *Vigisospirura potekhini* larvae, *Physaloptera praeputiale* larvae,

Abbreviata uzbekistanica, *A. abbreviata*, *A. kazachstanica*, *A. skrjabini*, *Pseudabbreviata markovi*, *Pseudabbreviata* sp. (according to Radchenko, 1976), *Agamospirura magna* larvae, *Agamospirura* sp1. Gaphurov, 1978, larvae.

Family Anguidae

Sheltopusik - *Pseudopus apodus* (Pallas, 1775)

Helminths: Cestodes - *Oochoristica tuberculate*, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides lineatus* larvae; Acanthocephalan - *Macracanthorhynchus catulinus* larvae; Nematodes - *Paraentomelas kazachstanika*, *Hexadontophorus ophisauri*, *Ophidascaris* sp., Kuchbaev, Kucharova et al., 2001, *Parapharyngodon skrjabini*, *Parapharyngodon szczerbaki*, *Skrjabinodon schikhobalovi*, *Ascarops strongylina* larvae, *Physocephalus sexalatus* larvae, *Spirocerca lupi* larvae, *Physaloptera dentata* larvae, *Abbreviata abbreviata*, *A. kazachstanica*.

Family Lacertidae

Multi-colored Racerunner - *Eremias arguta uzbekistanica* Cernov, 1934

Helminths: Nematodes - *Spauligodon eremiasi*, *Spauligodon pseudoeremiasi*, *S. saxicolae*, *S. phrynocephali*, *Abbreviata abbreviata*, *Pseudabbreviata markovi*.

Uzbek Racerunner - *Eremias* ssp. Uzbekistanica

Helminths: Cestodes - *Mesocestoides lineatus* larvae; Nematode - *Pharyngodon mamillatus*.

Family Lacertidae

Reticulated Racerunner - *Eremias grammica* (Lichtenstein, 1823)

Helminths: Cestodes - *Oochoristica sobolovi*, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides lineatus* larvae; Nematodes - *Pharyngodon mamillatus*, *Spauligodon eremiasi*, *S. parasskiffi*, *S. phrynocephali*.

Intermediate Racerunner - *Eremias intermedia* (Strauch, 1876)

Helminths: Cestodes - *Oochoristica tuberculate*, *O. sobolovi*, *Diplopylidium polyacantha* larvae, *Joyeuxiella echinorhynchoides* larvae; Trematode - *Alaria alata* larvae; Acanthocephalans - *Prosthorhynchus transversus acantella*, *Centrorhynchus globocaudatus acantella*, *Macracanthorhynchus catulinus* larvae; Nematodes - *Parapharyngodon szczerbaki*, *Pharyngodon elongata*, *Spauligodon annaevi*, *S. eremiasi*, *S. pseudoeremiasi*, *S. saxicolae*, *Physaloptera clausa* larvae.

Lineated Racerunner - *Eremias lineolata* (Nikolsky, 1896)

Helminths: Cestode - *Mesocestoides lineatus* larvae; Nematodes - *Spauligodon annaevi*, *S. saxicolae*, *S. lacertae*, *Skrjabinodon schikhobalovi*, *Physocephalus sexalatus* larvae, *Pseudabbreviata markovi*.

Multi-ocellated Racerunner - *Eremias multiocellata* Günther, 1872

Helminths: Nematode - *Spauligodon parasskiffi*.

Black-spotted Racerunner - *Eremias nigrocellala* Nikolsky, 1896

Helminths: Acanthocephalan - *Prosthorhynchus transversus acantella*; Nematodes - *Spauligodon annaevi*, *S. eremiasi*, *S. pseudoeremiasi*, *S. phrynocephali*, *Skrjabinodon pigmentatus*, *Abbreviata abbreviata*.

Nikolski's Racerunner - *Eremias nikolskii* Bedriaga, 1905

Helminths: Nematode - *Abbreviata abbreviata*.

Striped Racerunner - *Eremias scripta* (Strauch, 1867)

Helminths: Nematodes - *Spauligodon eremiasi*, *S. saxicolae*, *S. lacerate*.

Lazdin's Striped Racerunner - *Eremias scripta lasdini* Tsarevsky, 1918

Helminths: Nematode - *Spirocerca lupi* larvae.

Fergana Striped Racerunner - *Eremias scripta pherganensis* Szczerbak et Washetko, 1973

Helminths: Acanthocephalan - *Macracanthorhynchus catulinus* larvae.

Rapid Racerunner - *Eremias velox* (Pallas, 1771)

Helminths: Cestodes - *Oochoristica tuberculate*, *O. sobolovi*, *Diplopylidium noelleri* larvae, *Joyeuxiella echinorhynchoides* larvae, *Mesocestoides lineatus* larvae; Trematode - *Plagiorchis elegans* larvae; Acanthocephalans - *Prosthorhynchus transversus acantella*, *Sphaerirostris teres* larvae, *Moniliformis moniliformis* larvae, *Macracanthorhynchus catulinus* larvae; Nematodes - *Strongyloides darevskyi*, *Amplicaecum schikhobalovi*, *Parapharyngodon szczerbaki*, *Pharyngodon elongata*, *Spauligodon annaevi*, *S. eremiasi*, *S. parasskiffi*, *S. lacertae*, *S. phrynocephali*, *Skrjabinodon schikhobalovi*, *Ascarops strongylina* larvae, *Spirocerca lupi* larvae, *Abbreviata uzbekistanica*, *A. abbreviata*, *A. schulzi*, *Pseudabbreviata markovi*, *Thubunaea schukurovi*.

Family Scincidae

Desert Snake-eyed Skink - *Ablepharus deserti* Strauch, 1867

Helminths: Cestode - *Joyeuxiella echinorhynchoides* larvae; Acanthocephalan - *Prosthorhynchus transversus acantella*; Nematodes - *Pharyngodon mamillatus*, *Skrjabinodon schikhobalovi*, *Spirocerca lupi* larvae, *Skrjabinelazia hoffmanni*.

Asian Snake-eyed Skink - *Ablepharus pannonicus* (Fitzinger, 1823)

Helminths: Cestode - *Oochoristica tuberculate*; Nematode - *Gongylonema pulchrum* larvae.

Table 1.

Taxonomic Structure of the Helminth Fauna of Reptiles in Uzbekistan.

Family	№	The number of identified species of helminths.

		Total species:	Cestoda	Trematoda	Acanthocephala	Nematoda
Testudinidae	1	11	-	-	-	11
Gekkonidae	7	21	5		1	15
Agamidae	15	53	13	2	5	33
Anguidae	1	16	3	-	1	12
Lasertidae	12	39	7	1	6	25
Scincidae	2	2	1	-	1	4
Всего:	38	146	29	3	14	100

Analysis of the helminth fauna of seven studied reptile families in Uzbekistan revealed that the helminth fauna is richest and most diverse in the family Agamidae, with 53 species. This can be attributed, firstly, to its wide distribution across all geographical zones, and secondly, to the large sample size (15 species) examined in the study. The family Lacertidae ranks second in helminth diversity, hosting 39 species, followed by Gekkonidae with 21 species, Anguidae with 16 species, and Testudinidae with 11 species. The relatively low number of species (only 6 species) recorded in Scincidae is primarily due to the small number of reptiles studied and investigations conducted at only three sites in different regions of Uzbekistan (see Table 1). The future prospects for helminthological studies of the reptile fauna in Uzbekistan are associated, on one hand, with an increase in the number of reptiles studied, and on the other hand, with the expansion of research areas.

REFERENCES

1. Sultanov M.A., Kabilov T.K., Davlatov N. Materials on the helminth fauna of reptiles of Uzbekistan // Proceedings of the Academy of Sciences of the Uzbek SSR, 1975, No. 6. - 51-52 pp. [In Russian]
2. Muminov P.A., Sultanov M.A., Elbusinova M., Siddikov B.Kh., Mavlyanova R.D. Helminths of reptiles // In the book: Ecology of animal parasites in the northeast of Uzbekistan. - Tashkent, Fan, 1984. - P. 62. [In Russian]
3. Kuchboev A.E., Kucharova I.Sh., Azimov D.A, Ikromov E.F. Helminths of reptiles of Uzbekistan. Uzbek Biological Journal, 2001. - No. 1. - 53-57 pp. [In Russian]
4. Ikromov E.F. Fauna and ecology of helminths of reptiles in Uzbekistan // Bulletin of the Karakalpak Branch of the Academy of Sciences of the Republic of Uzbekistan. - 2006. - No. 2. - Nukus. - 19-20 pp. [In Russian]
5. Ikromov E.F. Helminth fauna of amphibians and reptiles in Uzbekistan and factors contributing to its formation // Bulletin of the Karakalpak Branch of the Academy of Sciences of the Republic of Uzbekistan. - 2019. - No. 3. - Nukus. - 40-43 pp. [In Russian]
6. Kuchboev, A. E., Karimova, R. R., Ruziev, B. K., Salakhutdinov, I. B., & Egamberdiev, S. S. (2016). Morphological and molecular identification of some species of nematode of the family Protostrongylidae Leiper, 1926.
7. Рузиев, Б. Х. (2001). О ГЕЛЬМИНТОФАУНЕ ОВЕЦ ПУСТЫННЫХ ЭКОСИСТЕМ ЮГА УЗБЕКИСТАНА. Паразитология, 35(2).
8. Кучбоев, А. Э., Каримова, Р. Р., Рузиев, Б. Х., Салахутдинов, И. Б., & Эгамбердиев, Ш. Ш. (2015). Морфологическая и молекулярная характеристика некоторых видов нематод семейства Protostrongylidae Leiper, 1926. Российский паразитологический журнал, (3), 7-14.
9. Кучбоев, А. Э., Каримова, Р. Р., Рузиев, Б. Х., Салахутдинов, И. Б., & Эгамбердиев, Ш. Ш. (2015). Морфологическая и молекулярная характеристика некоторых видов нематод семейства Protostrongylidae Leiper, 1926. Российский паразитологический журнал, (3), 7-14.
10. Kuchboev, A. E., Karimova, R. R., Pazilov, A., Ruziev, B. H., & Amirov, O. O. (2017). Terrestrial mollusks of Uzbekistan-intermediate hosts of protostrongylids (Nematoda: Protostrongylidae).
11. Карабекова, Д. У., Исакова, С. А., & Остащенко, А. Н. (2019). К ЭКОЛОГО-ФАУНИСТИЧЕКОМУ ИССЛЕДОВАНИЮ ГЕЛЬМИНТОВ ГРЫЗУНОВ (RODENTIA) ЧУЙСКОЙ ОБЛАСТИ. Исследование живой природы Кыргызстана, (1-2), 51-56.
12. Abdikayumovna, X. G. (2023). Mazkur maqolada Respublikamizdagi suv omborlarda uchraydigan mollyuskalarning turlari, yashash sharoitlari, tuzilishi, faunasi, ekologiyasi, tarqalishi va inson hayotidagi ahamiyati haqida ma'lumotlar keltirilgan. JOURNAL OF HEALTHCARE AND LIFE-SCIENCE RESEARCH, 2(5), 78-81.
13. Бобоназаров, Г. Я., & Омонова, Н. Р. (2021). OZBEKISTONDA YIRIK SHOXLI QORAMOLLAR TERI OSTI OQRASI HYPODERMA BOVUS (DIPTERA) ORGANILISHIGA DOIR. Журнал Биологии и Экологии, 3(1).

14. Bobonazarov G. Y., Omonova N. R., Rabimova Z. S. STUDY OF THE NOSOPHARNETIC GADDLE OF SHEEP Oestrus ovis L.(DIPTERA: OESTRIDAE) //THE ROLE OF SCIENCE AND INNOVATION IN THE MODERN WORLD. – 2022. – Т. 1. – №. 1. – С. 95-101.
15. Yusupovich, R. A. (2022). ECOLOGICAL-FAUNIST ANALYSIS OF COXINALLIDES (COLEOPTERA, COCCINELLIDAE) OF THE KARSHI OAKH. *Spectrum Journal of Innovation, Reforms and Development*, *4*, 331-335.
16. Norkobilova, Z. B., Burieva, X. P., & Arabova, N. Z. (2024). THE IMPORTANCE OF DRAGONFLIES IN ALHAGI PSEUDALHAGI (M. BIEB.) DESV. EX WANGERIN PEST ELIMINATION. *Actual problems and prospects of the study of the fauna*, *1*(01).
17. Qizi, N. Z. B. (2024). PROSPECTS FOR THE FUTURE STUDY OF THE ODONATA ORDER: A REVIEW OF PUBLISHED ARTICLES FROM THE SCOPUS DATABASE 2019–2023. *European science review*, (3-4), 13-22.
18. Davronov, B., & Orziyeva, Y. (2024). QASHQADARYO VILOYATI HUDUDIDA UCHRAYDIGAN HYGROMIIDAE OILASI (Tryon, 1866) FAUNASINING O ‘RGANILGANLIK HOLATI. Actual problems and prospects of the study of the fauna, 1(01).
19. Toshov, O. J. (2021). BIOTSENOTIC RELATIONS OF REPTILES ANIMALS IN THE DESERT ECOSYSTEMS OF THE SOUTHERN REGION OF UZBEKISTAN. *Экономика и социум*, (4-1 (83)), 423-425.
20. Davronov, B., Xoliqulova, G., & Maxmarajabov, D. (2024). QURUQLIK QORINOYOQLI MOLLYUSKALARINING SHAHAR BIOTOPLARI BO ‘YICHA TARQALISHI. Actual problems and prospects of the study of the fauna, 1(01).